

**Montana Board of Oil and Gas Conservation
Environmental Assessment**

Operator: Continental Resources, Inc.

Well Name/Number: Ardelle HSL

Location: NE NE Section 9 T23N R55E

County: Richland, **MT;** **Field (or Wildcat)** W/C (Bakken Horizontal)

Air Quality

(possible concerns)

Long drilling time: No, 20 to 30 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick drilling rig to drill a single lateral Bakken Formation single lateral horizontal well, 19,983' MD/10,090' TVD.

Possible H₂S gas production: Slight chance H₂S gas from Mississippian Formations.

In/near Class I air quality area: No, closest Class I air quality area is the Fort Peck Indian Reservation, about 22 miles to the north from this location.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under 75-2-211.

Mitigation:

☒ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: _____

Comments: No special concerns – using triple rig to drill a single lateral horizontal Bakken Formation test, 19,983' MD/10,090' TVD. If there is an existing gathering system for natural gas in the area, then associated gas can be gathered or if no gathering system nearby gas can be flared under Board Rule 36.22.1220

Water Quality

(possible concerns)

Salt/oil based mud: Yes to intermediate casing string hole to be drilled with oil based invert drilling fluids (oil/water ratio of 70/30 to 80/20). Horizontal lateral will be drilled with brine water. Surface casing hole will use freshwater and freshwater mud system (Rule 36.22.1001).

High water table: No

Surface drainage leads to live water: Yes, nearest drainages are unnamed ephemeral tributary drainage to East Fork of Fox Creek. Location is about 1/8 of a mile to the northeast and 1/4 of a mile to the southwest from these unnamed ephemeral tributary drainages. A stock pond exists in the East Fork of Fox Creek, about 1.75 miles to the south southeast.

Water well contamination: No, closest water wells are all 1 mile and further in a radius around this location. Surface casing will be drilled with freshwater and steel surface casing set and cemented from 1820' to protect freshwater zones, rule 36.22.1001.

Porous/permeable soils: No, silty sandy clay soils.

Class I stream drainage: No Class I stream drainages in the area of review.

Mitigation:

☐ Lined reserve pit

☒ Adequate surface casing

☐ Berms/dykes, re-routed drainage

☒ Closed mud system
☒ **Off-site disposal of liquids (in approved facility)**
☒ Other: Cuttings pit for the well cuttings disposal will be lined with a 16 mil impervious synthetic liner. Cuttings pit will be solidified if necessary and then backfilled. Cuttings will be disposed of on the wellsite.

Comments: 1820' of surface casing cemented to surface adequate to protect freshwater zones, rule 36.22.1001.

Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No, stream crossings anticipated. Location will be accessed off county gravel road, #301.

High erosion potential: Yes possible high erosion potential due to moderate cut and fill on this location. The location will require a moderate cut, up to 20.6' and moderate fill, up to 15.0'.

Loss of soil productivity: No, location will be restored after drilling, if nonproductive. If productive unused portion of the drillsite will be reclaimed.

Unusually large wellsite: No, large wellsite, 450'X400' location size required for the Ardelle HSL well location.

Damage to improvements: No, surface use appears to be cultivated fields.

Conflict with existing land use/values: Slight

Mitigation

- ☐ Avoid improvements (topographic tolerance)
- ☐ Exception location requested
- ☒ Stockpile topsoil
- ☐ Stream Crossing Permit (other agency review)
- ☒ Reclaim unused part of wellsite if productive
- ☐ Special construction methods to enhance reclamation
- ☐ Other _____

Comments: Access will be off of an existing county road #301 and existing lease road. About 3055' of new road will be built and/or upgraded for heavy trucks into this location off the existing lease road. Cuttings will be buried in the lined cuttings pit. Cuttings pit will be closed with subsoils when dry. Oil based invert drilling fluids will be recycled. Completion fluids will be hauled to a commercial disposal. No special concerns.

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Closest residences are about 7/8 of a mile to the west southwest, 1.625 miles to the northeast and about 2.325 miles to the northwest from this location.

Possibility of H2S: Slight chance of H2S from Mississippian Formations.

Size of rig/length of drilling time: Triple drilling rig 20 to 30 days drilling time.

Mitigation:

- ☒ Proper BOP equipment
- ☐ Topographic sound barriers
- ☐ H2S contingency and/or evacuation plan
- ☒ Other: H2S safety equipment standard for the area.

Comments: Adequate surface casing cemented to surface with an operational BOP stack (annular and double ram (pipe and blinds) rated for 5,000 psig) should mitigate any problems, Rule 36.22.1014.

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): Fox Lake Game Management Area, about 6.25 miles to the south from this location.

Proximity to recreation sites: Fox Lake Game Management Area, about 6.25 miles to the south from this location.

Creation of new access to wildlife habitat: No

Conflict with game range/refuge management: None identified.

Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Least Tern, Whooping Crane and Piping Plover.

Candidate specie is the Sprague's Pipit and the Greater Sage Grouse. NH tracker website indicate zero (0) species of concern in this township and range.

Mitigation:

☐ Avoidance (topographic tolerance/exception)

☐ Other agency review (DFWP, federal agencies, DSL)

☐ Screening/fencing of pits, drillsite

☐ Other: _____

Comments: Private cultivated surface lands. There may be species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern are discovered at this location. The Montana Board of Oil & Gas does not exert any control over surface lands. No concerns.

Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites None identified.

Mitigation

☐ avoidance (topographic tolerance, location exception)

☐ other agency review (SHPO, DSL, federal agencies)

☐ Other: _____

Comments: Private cultivated surface lands. There may be possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Montana Board of Oil & Gas does not exert any control over surface lands. No concerns.

Social/Economic

(possible concerns)

☐ Substantial effect on tax base

☐ Create demand for new governmental services

☐ Population increase or relocation

Comments: Wildcat well. No concerns.

Remarks or Special Concerns for this site

Well is a Bakken Formation single lateral horizontal well, 19,983'MD/10,090'TVD, well test in Richland County

Summary: Evaluation of Impacts and Cumulative effects

No long term impacts expected. Some short term impacts will occur.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): Steven Sasaki

(title:) Chief Field Inspector

Date: July 3, 2013

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website

(Name and Agency)

Richland County water wells

(subject discussed)

July 3, 2013

(date)

US Fish and Wildlife, Region 6 website

(Name and Agency)

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES

MONTANA COUNTIES, Richland County

(subject discussed)

July 3, 2013

(date)

Montana Natural Heritage Program Website

(Name and Agency)

Heritage State Rank= S1, S2, S3 T23N R55E

(subject discussed)

July 3, 2013

(date)

Montana Cadastral Website

(Name and Agency)

Surface Ownership and surface use Section 9 T23N R55E

(subject discussed)

July 3, 2013

(date)

DNRC Trust Lands TLMD minerals website

(Name and Agency)

State of Montana minerals and surface lands

(subject discussed)

July 3, 2013

(date)

If location was inspected before permit approval:

Inspection date: _____

Inspector: _____

Others present during inspection: _____